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SEAT BELT USE IN EDMONTON:
Results from a survey

by

J. Jayachandran

and

P. Krishnan

Department of Sociology
University of Alberta
Edmonton, Alberta

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INTRODUCTION

Research has demonstrated that seat belts effectively reduce injury and death in automobile accidents (Fhaner and Hane, 1973; Green, 1976; Hodson-Walter, 1970). They also reduce the severity of injury in other circumstances; but they are designed primarily to protect against injury in head-on collisions and frontal impacts in general. Most people are aware of this (Knapper, Cropley and Moore, 1976). Despite this fact, only a small percentage of motorists wear lap belts or shoulder harnesses. Forgetfulness, laziness, inconvenience and discomfort are reasons given for not wearing belts (Knapper et.al, 1976; Fhaner and Hane, 1973).

A large number of studies are available on seat belt use. These studies may be based on either actual use at the time of the survey or verbal reports of use. The characteristics of the users most frequently collected in these studies include: demographic, situational and attitudinal and personality variables.

Demographic and other background variables such as age, sex, education, marital status, socioeconomic status etc. have been used by researchers to differentiate between seat belt users and non-users. Majority of the studies show age is positively related to belt use (Council, 1969; Dobson, 1970; Bohlin, 1967). However, there are studies which show no relationship between age and seat belt use (Campbell, et.al, 1967; Waller and Barry, 1969). Some others show that this relationship holds true only for men (Manheimer et.al, 1966). No gender differential is noticed in seat belt use (Manheimer et.al, 1966; Waller and Barry, 1969). Education, on the other hand, shows strong association with seat belt use (Manheimer and Mellinger, 1964; Manheimer et.al, 1966; Morgan, 1967). Married people are more likely to use seat belt than single persons (Manheimer and Mellinger, 1964; Dobson, 1970).

The influence of situational variables has received little attention in seat belt studies (Fahner and Hane, 1973). The importance of situational factors has been underestimated,

probably, due to lack of consistent findings. There is evidence for the importance of situational factors such as traffic environment, distance and speed, while the findings on other factors such as weather conditions, time of delay and day of week are inconsistent. All studies report higher usage of seat belts by motorists while driving on highways, long distance and high speed (New York State Department of Motor vehicles, 1963a; Campbell et.al, 1967; Council, 1969; Knapper et. al, 1976).

Behaviour is mediated by underlying systems of opinions, beliefs and attitudes. This can be understood when these intangible and subjective psychological aspects are indentified. In other words, it is necessary to examine the attitudes of drivers and passengers with regard to seat belt use. Many studies have focused on attitudinal and personality differences between belt-users and non-users with regard to traffic safety in general and seat-belts specifically. In general, users and non-users express a very favorable attitude to seat belts as a safety measure (Manheimeer et.al, 1966; Manheimer and Mellinger, 1967; Dobson, 1970). However, many of the non-users have no objections to belts, but reports indicate that forgetfulness, laziness etc as reasons for non use (Waller and Barry, 1969). Inconvenience, discomfort and fear of entrapment are frequent answers (New York State Department of Motor Vehicles, 1963a; Manheimer and Mellinger, 1967).

The purpose of this study is to identify the factors that determine the use of seat belts in Edmonton.

METHODOLOGY

Sampling Design

A sample of 300 respondents was selected from the Edmonton Telephone Directory through a systematic sampling procedure. First, using the random tables, 100 pages were selected at random. Then, from each of those 100 pages 3 telephone numbers were selected systematically. The survey was conducted in the months of July and August in 1986. The selected respondents were interviewed through telephone by using a structured questionnaire.

Out of these 300 respondents 32 (11%) refused to answer and 40 (13.3%) said that they did not drive. The respondents who did not drive were deleted from the analysis. The final sample consisted of 120 males and 108 females (N=228). The questionnaire used in the study is shown in Appendix A. This questionnaire was approved by the Ethics Committee of the Department of Sociology and the Faculty of Arts.

Variables

The primary dependent variable in this study is use of seat belt as a driver (SDRIVER). The independent variables include demographic, socioeconomic, situational and attitudinal variables. These variables are as follows: demographic variables: age,sex,marital staus, and number of children in the family; socioeconomic status variables: level of education and employment status; situational variables: these are based on answers to the question whether the motorist uses seat belt within city or on highways; attitudinal variable: the respondent's opinion towards seat belt use.

Data Analysis

Data are analysed by bivariate and multivariate techniques. Since many of the independent variables used in this study are nominal, ANOVA might be an appropriate tool. In addition, it makes the presentation and understanding of the relationships between variables easier. Multiple regression is also carried out for incorporating all possible predictors in the model. Categories of some of the variables are regrouped as appropriate. The names and descriptions of the variables are given in table 1.

FINDINGS

Table 2 shows the results from a one-way analysis of variance for all the variables. Except for marital status, all other variables have significant influence on seat belt use. The average seat belt use for the whole population is 2.58. The individuals who use seat belt below

Table 1. Name and description of the variables

Variable	Description
SEX	Respondents sex (0=female, 1=male)
AGE	Respondents age in years
MARITAL	Respondents marital status (0= not married, 1=married)
CHILDREN	Number of children in the family
EDUC	Respondents education in years
EMPSTATS	Respondents employment status (0= not employed, 1=employed)
SDRIVER	Use seat belt as driver (1= never ... 4=always)
DCITY	Use seat belt within city (0=no, 1=yes)
DHIWAYS	Use seat belt on highways (0=no, 1=yes)
PASSENGR	Use seat belt as passenger (1=never ... 4=always)
PCITY	Use seat belt within city (0=no, 1=yes)
PHIWAYS	Use seat belt on highways (0=no, 1=yes)
OPINION	Opinion about use of seat belts

Table 2. Results from one-way analysis of variance for all variables.

VARIABLE	CATEGORY	N	DEVIATION	F	R^2
SEX	Female	108	0.17	4.888	.021
	Male	120	-0.15		
MARITAL	Married	129	0.28	20.463	.083
	Not married	99	-0.37		
EMPSTATS	Employed	141	0.27	24.135	.096
	Not employed	87	-0.44		
AGE	00 - 28	54	-0.80	14.684	.164
	29 - 38	84	0.28		
	39 - 48	51	0.13		
	49 +	39	0.34		
CHILDREN	0,1	72	-0.35	12.390	.125
	2,3	87	0.10		
	4+	18	0.90		
EDUC	6 - 12	78	-0.39	8.181	.068
	13 - 15	75	0.10		
	16 - 19	75	0.30		
OPINION	Yes	189	0.25	70.065	.237
	No	39	-1.19		
DCITY	Yes	93	0.97	245.361	.521
	No	135	-0.67		
DHIWAYS	Yes	195	0.25	97.448	.301
	No	33	-1.49		
PASSENGR	Never	78	-1.00	74.822	.501
	Occassionally	66	0.10		
	Usually	21	0.56		
	Always	63	0.94		
PCITY	Yes	90	0.82	123.564	.353
	No	138	-0.54		
PHIWAYS	Yes	165	0.40	117.346	.342
	No	63	-1.06		

this average can be characterized in general as males, young, unmarried, less educated, unemployed, and with fewer children. In addition, those reported that they don't use seat belt within city or on highways, either as a driver or passenger, are less likely to use seat belt compared to the total population. Respondents who have favourable attitude to seat belt use are likely to use seat belt. Similarly, if individuals use seat belt as a passenger that increases their chance of using it while they drive a car. The explained variance (R^2) given in table 2 indicates that non-socioeconomic and demographic variables exhibit greater association with seat belt use.

Table 3 shows the effect of each variable controlled for other variables. As mentioned earlier, only background and attitudinal variables are included in the model. All the variables have significant influence on seat belt use. Table 4 shows the adjusted and unadjusted influence of each variable in the model. When adjusted for other variables, respondents' sex, employment status, and family size tend to show greater influence on seat belt use. However, the direction of effect of these variables has not changed. The increment in association is much greater for respondents' sex followed by number of children and employment status. The effect of the remaining variables is suppressed when held constant for other variables. The decrement is remarkable for respondents' education followed by their opinion on seat belt use, age and marital status. Over all, the model explains 50 per cent of the variation in seat belt use.

In order to incorporate all necessary variables into the model, a multiple regression analysis is carried out. However, prior to presenting the results, it is necessary to caution that some of the pearson's correlation coefficients (table 5) are high; therefore, multicollinearity problem might arise and would affect the regression coefficients.

Table 6 presents the results of the multiple regression analysis. Except for education, age and opinion, no other variables have significant effect in comparision to the results in table 3. The situational factors (city or highways) have significant influence on seat belt use only when the respondents are drivers. Although the probability of respondent's using seat

Table 3. Results from analysis of variance for selected variables.

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Main Effects	134.955	14	9.640	26.433	.000
PASSENGR	38.673	3	12.891	35.348	.000
SEX	5.302	1	5.302	14.539	.000
MARITAL	.791	1	.791	2.169	.143
EMPSTATS	1.979	1	1.979	5.426	.021
AGE	3.532	3	1.177	3.228	.024
CHILDREN	16.760	2	8.380	22.979	.000
EDUCATIN	7.366	2	3.683	10.099	.000
OPINION	3.853	1	3.853	10.564	.001
Explained	134.955	14	9.640	26.433	.000
Residual	59.079	162	.365		
Total	194.034	176	1.102		

Table 4. Results of Multiple Classification Analysis for selected variables.

Grand Mean = 2.76

Variable + Category	N	Unadjusted Dev'n	Eta	Adjusted for Independents Dev'n	Beta
PASSENGR					
1 NEVER	42	-1.12		-.83	
2 OCCASSIONALLY	60	-.01		-.09	
3 USUALLY	21	.38		.21	
4 ALWAYS	54	.74		.66	
			.66		.53
SEX					
0 FEMALE	84	.09		.21	
1 MALE	93	-.09		-.19	
			.09		.19
MARITAL					
0 NOT MARRIED	48	-.26		-.12	
1 MARRIED	129	.10		.04	
			.15		.07
EMPSTATS					
0 NOT EMPLOYED	57	-.34		-.21	
1 EMPLOYED	120	.16		.10	
			.22		.14
AGE					
1 00 - 28	9	-1.10		-.34	
2 29 - 38	78	.08		-.08	
3 39 - 48	51	-.06		.25	
4 49 +	39	.16		-.09	
			.25		.16
CHILDREN					
1 0,1	72	-.35		-.28	
2 2,3	87	.10		.01	
3 4+	18	.90		1.09	
			.35		.37
EDUCATIN					
1 6 - 12	63	-.48		-.38	
2 13 - 15	51	.06		.17	
3 16 - 19	63	.43		.24	
			.37		.27
OPINION					
0 NO	18	-1.10		-.54	
1 YES	159	.12		.06	
			.35		.17
Multiple R Squared					.696
Multiple R					.834

Table 5. Pearsons correlation coefficients for all the variables in the multiple regression model.

Correlation, 1-tailed Sig:

	SDRIVER	PASSENGR	SEX	AGE	MARITAL	EMPSTATS	CHILDREN	EDUCATIN	DCITY	DHIWAYS	PCITY	PHIWAYS	OPINION
SDRIVER	1.000	.683	-.146	.296	.288	.311	-.302	.253	.721	.549	.595	.585	.486
	.999	.000	.014	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PASSENGR	.683	1.000	-.090	.284	.220	.220	-.291	.111	.659	.445	.714	.596	.318
	.000	.999	.088	.000	.000	.000	.000	.047	.000	.000	.000	.000	.000
SEX	-.146	-.090	1.000	.099	.073	.177	.006	.081	-.178	-.240	.011	-.350	-.221
	.014	.088	.999	.067	.137	.004	.465	.111	.004	.000	.432	.000	.000
AGE	.296	.284	.099	1.000	.309	.041	-.633	-.216	.258	.280	.268	.055	.250
	.000	.000	.067	.999	.000	.269	.000	.001	.000	.000	.000	.204	.000
MARITAL	.288	.220	.073	.309	1.000	.241	-.612	.083	.187	.319	.164	.230	.166
	.000	.000	.137	.000	.999	.000	.000	.105	.002	.000	.006	.000	.006
EMPSTATS	.311	.220	.177	.041	.241	1.000	-.230	.384	.266	.216	.246	.241	.147
	.000	.000	.004	.269	.000	.999	.000	.000	.000	.001	.000	.000	.013
CHILDREN	-.302	-.291	.006	-.633	-.612	-.230	1.000	-.032	-.186	-.408	-.237	-.236	-.343
	.000	.000	.465	.000	.000	.000	.999	.317	.002	.000	.000	.000	.000
EDUCATIN	.253	.111	.081	-.216	.083	.384	-.032	1.000	.079	.130	.046	.206	.206
	.000	.047	.111	.001	.105	.000	.317	.999	.118	.025	.246	.001	.001
DCITY	.721	.659	-.178	.258	.187	.266	-.186	.079	1.000	.341	.754	.453	.306
	.000	.000	.004	.000	.002	.000	.002	.118	.999	.000	.000	.000	.000
DHIWAYS	.549	.445	-.240	.280	.319	.216	-.408	.130	.341	1.000	.256	.666	.608
	.000	.000	.000	.000	.000	.001	.000	.025	.000	.999	.000	.000	.000
PCITY	.595	.714	.011	.268	.164	.246	-.237	.046	.754	.256	1.000	.439	.152
	.000	.000	.432	.000	.006	.000	.000	.246	.000	.000	.999	.000	.011
PHIWAYS	.585	.596	-.350	.055	.230	.241	-.236	.206	.453	.666	.439	1.000	.501
	.000	.000	.000	.204	.000	.000	.000	.001	.000	.000	.000	.999	.000
OPINION	.486	.318	-.221	.250	.166	.147	-.343	.206	.306	.608	.152	.501	1.000
	.000	.000	.000	.000	.006	.013	.000	.001	.000	.000	.011	.000	.999

Table 6. Results from multiple regression analysis for all the variables.

Multiple R	.83826	Analysis of Variance			
R Square	.70268		DF	Sum of Squares	Mean Square
Adjusted R Square	.68608	Regression	12	199.26446	16.60537
Standard Error	.62623	Residual	215	84.31449	.39216
		F = 42.34331		Signif F = .0000	

Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
OPINION	.370561	.150705	.125118	2.459	.0147
EMPSTATS	.060344	.102132	.026284	.591	.5552
AGE	.125055	.060794	.114162	2.057	.0409
SEX	-.009792	.101314	-.004384	-.097	.9231
PCITY	.036340	.155893	.015927	.233	.8159
MARITAL	.184302	.111593	.081910	1.652	.1001
EDUCATIN	.203948	.059348	.149787	3.436	.0007
DHIWAYS	.454983	.184997	.143537	2.459	.0147
PASSENGR	.201558	.057553	.217470	3.502	.0006
CHILDREN	.002770	.001962	.089351	1.412	.1594
PHIWAYS	.162442	.158649	.065134	1.024	.3070
DCITY	.911554	.147951	.401686	6.161	.0000
(Constant)	.023730	.260542		.091	.9275

belt as a driver increases if they use it as a passenger, there is no significant influence of situational factors (PCITY,DHIWAYS). The reason for insignificant influence of some of the variables can be explained through the higher correlation among the independent variables. However, the model indicates that the use of seat belt as a driver increases if the respondents are young, educated and have a favorable opinion to use it. In addition, if the respondents use it within city (DCITY) or highways (DHIWAYS) that tends to increase the use of seat belt. Respondents who use seat belt as a passenger also are likely to use it when they drive.

Discussion

The level of seat belt use in the present study is drawn from respondents' self reports, and not from actual real-life observation of the driver behaviour. As Waller and Barry (1969) have reported, agreement between self-reported figures and those derived from actual observation of drivers on the road is only moderate, with a marked tendency for respondents to overestimate their levels of usage. Thus, the findings from this study based on respondents' estimates of their own degree of seat belt use must be interpreted with caution. However, many of the findings reported here are consistent with other studies reviewed earlier and reported here.

The results of the analysis indicate that the background variables continue to play a role in the respondents' decision to use seat belt. Education and age seem to be important even when controlled for other variables. Individuals who express favorable attitude to seat belt use tend to fasten seat belt more often than others. With regard to situational factors, individuals using seat belt when they drive within city are likely to increase their usage in general in comparision to those who report that they use it on highways. This is rather surprising, given this study was conducted prior to mandatory seat belt legislation, one would expect driver's within city might not use seat belt that often. Probably the individuals are accustomed to using seat belt, or they have just overestimated their usage within the city. This is in contradiction to other studies where a larger frequency of usage on highways than in city

is reported.

The responses to open ended questions, though not reported here, indicate that the majority of the people are in favor of seat belt use. They acknowledge the value of seat belts i.e protection from various injuries. Those who are not in favor reported that it is inconvenient and not comfortable. Based on their experience, some indicated that wearing seat belt may not save lives under certain circumstances. For example: in case of head-on collision on highways, seat belt might slow down or prevent the process of jumping out of the car, if one wants to do it. The respondents in general reported that they would use seat belt during winter and will wear it if it becomes mandatory.

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APPENDIX A
Questionnaire

Survey of Seatbelt use in Edmonton

Phone No:___

1. Sex:
   a. Male
   b. Female

2. Age (in completed years)
   a. __ in years.

3. What is your marital status ?
   a. Married
   b. Common-law
   c. Divorced
   d. Separted
   e. Widowed
   f. Never married

4. How many children are there in the family ?
   a. __in numbers

5. In total how many years of education did you complete?
   a. __ in years

6. What is your employment status ?
   a. Employed full time
   b. Employed part time
   c. Unemployed
   d. Retired
   e. In school
   f. Keeping house
   g. NR

7. Do you drive ?
   a. Yes (go to Q8)
   b. No (go to Q11)

8. Do you use seatbelts when you are the driver of a car ?
   a. Never
   b. Occassionally
   c. Usually
   d. Always
   e. NR

9. Do you use it within city limits ?
   a. Yes
   b. No

10. Do you use it on highways ?
   a. Yes
   b. No

11. Do you use seatbelts when you are a passenger in a car ?
   a. Never
   b. Occassionally
   c. Usually
   d. Always
   e. NR

12. Do you use it within city limits ?
   a. Yes
   b. No

13. Do you use it on highways ?
   a. Yes
   b. No

14. Do you think driver of a car should use seatbelts ?
   a. Yes
   b. No

15. What are the reasons ?

16. Other comments (prob on any seasonal use of seatbelts)

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